RESTRICTED CIRCULATION

This paper is not an official document; it is for information only and must not be quoted in any printed publication.

Agricultural Memorandum No. 802A
by J B Tyldesley

THE VERNALISATION RESPONSE AT CRANWELL

1. INTRODUCTION

Ag. Mem. 802 dealt with the response of ripening sugar beet seed to temperature, in terms of a response rising linearly from 0 at 2°C to 1 at 6°C, falling to 0 again at 10°C. The ripening period at Cranwell extends to the first half of September, when temperatures begin to fall into the vernalisation range. Nevertheless the vernalisation index V_1 calculated from accumulated temperatures computed by Thom's method is zero, and has accordingly been questioned by a reader. It is accepted that Thom's method is likely to be inaccurate when working on the edge of frequency distributions, and that this inaccuracy may be accentuated by the differencing method adopted in Ag. Mem. 802. This note attempts to get a better estimate of the vernalisation response at Cranwell.

2. METHOD

Use was made of the results of Shellard and Sarson, Met Mag. 91, 19-26, January 1962. This gives the percentage of hours above a given temperature from averages of daily maxima and minima. Monthly mean maximum, minimum and mean temperatures for Cranwell were plotted from Met O 375 (period 1931-60), and smooth curves drawn from which the values for the first half of September were estimated. From these the percentage of time for which the temperature exceeded 2,3.....10°C were found, and the percentage in each 1°C range 0-1, 1-2.....9-10°C found by differencing. The differencing exposed the lack of precision in reading off the graphs in the published paper, so slight smoothing was applied. Then the percentages in each temperature range were multiplied by the appropriate weighting (range 0-1) for the vernalisation response, and the products summed. This product was applied to a half-month of 15 days to give the time integrated vernalisation response.

3. RESULT

The average vernalisation response (V_1) at Cranwell for the first half of September is 0.64°C days. It was noted that the greatest contribution to this small total came from the 8-9°C temperature range. Table 2 of Ag Mem 802 now becomes:

Station	V_1 Ag Mem 802	V_1 amended	V_2 Ag Mem 802	V_2 amended
Visby	47	47	-584	-584
Cranwell	0	1	-452	-451
Bordeaux/ Toulouse	0	0	-638	-638
Ancona	0	0	-589	-589
Kestamon	0	0	-353	-353

FH23

4. DISCUSSION

Although the criticism of the original vernalisation response at Cranwell was justified a more accurate calculation discloses only a marginal difference which does not upset the conclusions of Ag. Mem, 802.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
MAFF
Windsor House
Cornwall Road
Harrogate
North Yorkshire
HG1 2PW

November 1976